

A COMPARISON OF TWO METHODS OF
OVERCOMING AVOIDANCE BEHAVIOR

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INTRODUCTION

There are those who have put forth theories of psychological disorders which appeal to learning concepts in explanation of etiology (Eysenck, 1960; Ullman and Krasner, 1965). Some of these people have derived psychotherapeutic regimes with a wide range of disorders by extension of learning theory concepts and laboratory conditioning paradigms (Bandura, 1961). On the other hand there are many who take issue with these theoretical positions and are able to point to serious difficulties when generalizing too broadly from laboratory data (Breger and McGaugh, 1965). Nonetheless, there seems to be some concensus that this approach has yielded some fairly effective techniques applicable to at least a limited number of problems (Bandura, 1961; Grossberg, 1964).

In reviewing the literature, it appears that two of these techniques and situations in which they are fairly consistently effective are:

1. Skinnerian operant techniques wherein reinforcement of discreet desired behavior is the primary technique. Such techniques have been primarily directed toward building behavior in those who show deficits in particular areas, or extinction of undesirable discreet responses (Ullman and Krasner, 1965). In particular, these techniques have been extensively reported as helpful in building of more positive sorts of behavior in inpatient settings, and although there are few reports of its resulting in cures per se, they apparently are helpful in ward management. They are also being used in building new behavior in children with behavior deficits, primarily with retarded and

autistic children and in extinction of undesirable overt behaviors.

2. The second is the concept of reciprocal inhibition developed from Pavlovian classical conditioning work. This technique is used primarily to overcome fear and avoidance behavior. It has been found particularly effective with anxiety neurosis in which the anxiety is well focused such as in phobias (Wolpe, 1958). The hypothesized therapeutic principle is that: "If a response antagonistic to anxiety can be made to occur in the presence of anxiety-evoking stimuli so that it is accompanied by a complete or partial suppression of the anxiety response, the bond between these stimuli and the anxiety responses will be weakened" (Wolpe, 1958). It is generally accepted among behavior therapists that it is also necessary to approach the anxiety provoking stimulus gradually so as to allow the reciprocally inhibitory response to occur (Wolpe, 1958). In fact this same principle was applied by Watson and Rayner (1920) and Jones (1924) wherein: (1) A rabbit was paired with a loud noise until the child (who showed no fear or avoidance prior to the pairing) showed fear of the rabbit. (2) The child was then allowed to eat in the presence of the rabbit--with the rabbit initially being a distance from the child. The rabbit was slowly moved closer to the child as the child ate. This procedure resulted in removal of fear and avoidance responses in the presence of the rabbit.

The reciprocal inhibition technique now being used is just this sort of arrangement. The hypothesized therapeutic factors are based on two assumptions:

1. "Counterconditioning" rather than "Extinction"¹ is taking place.

1. Extinction is herein defined in accordance with Pavlov's

2. Presentation of the feared stimulus by "Progressive approach"² is necessary.

Issues now being raised about these assumptions (Lomont, 1965) include:

1. Since in application of this technique, all conditions for pure extinction are present, then it may be that the counterconditioning agent is not in fact responsible for the effect, but that only extinction is occurring.

2. There is little comparative evidence supporting the assumption that presentation of a feared stimulus by a progressive approach leads to quicker removal of fear or avoidance than repeated full presentations.

3. Nothing is known about which procedure leaves the S least susceptible to either spontaneous recovery or reacquisition of the fear and avoidance. Is there a susceptibility difference in Ss following different treatment procedures?

It is proposed that some light may be shed upon these issues with the present experimental investigation. In the review of the relevant literature which follows, it may be seen that there have been

(1927) description, i.e. the specific procedure of presenting a stimulus unaccompanied by reinforcement.

Counterconditioning is herein defined as the set of operations which include along with the extinction procedure the addition of a new unconditioned stimulus which elicits a response antagonistic to the existing response.

2. Progressive approach refers to the presentation of a feared stimuli in ranked order on the dimension of quantity of fear aroused, the stimulus evoking least fear being presented first. Also, decreasing distance from the feared stimulus and increasing time of exposure may be utilized in progressive approach (Wolpe, 1958).

only a very few studies directly concerned with the questions raised by Lomont (1965). Other studies are included in the review which indirectly deal with some of these questions.

Extinction vs. counterconditioning

Wolpe (1958) attempted to arrive at a clinically therapeutic treatment regime through the process of applying experimental data to clinical situations. Specifically, he conducted a series of studies in which cats were first conditioned to fear stimuli previously associated with feeding. In order to eliminate the fear, he then began to feed the Ss at decreasing distances from the feared stimuli until the Ss were able to eat freely again under the full influence of the conditioned stimuli. The assumption here is that eating and the fear reactions are reciprocally inhibitory so that when feeding occurs in the presence of the conditioned fear stimuli, the fear reaction is inhibited and gradually eliminated.

This paradigm was extended in the clinical situation to include such responses as relaxation, sexual arousal and assertiveness, all of which were to be paired with stimuli which arouse fear in the patient.

At this point the question may be raised as to whether the feeding (or any other counterconditioning agent) itself was necessary in obtaining the results. An alternative explanation may be that the feeding merely held the Ss in the fear arousing situation long enough for extinction to occur. These experiments do not control for separate analysis of extinction and counterconditioning effects as there is no pure extinction group included.

Lomont (1965) points out that in order to conclude that the reciprocal inhibition procedure really eliminates anxiety through

counterconditioning it is necessary to demonstrate that it is effective under conditions where extinction cannot fully account for its efficacy. Lomont (1965) reviews four animal studies in which some attempts at controlled comparisons were made. In three of these studies, the counterconditioning procedure consisted of confining and feeding rats in the fear conditioning apparatus between conditioning and regular extinction. An extinction group was confined for the same length of time but not fed.

In two of these studies (Sermat and Shephard, 1959; Lane, 1954) avoidance responses were measures of fear acquisition and extinction. Sermat and Shephard (1959) found no difference between counterconditioning and extinction groups while Lane (1954) found the counterconditioning procedure more effective than the extinction procedure, however, there was opportunity for a great deal of movement through the apparatus and the effect of feeding could have been to expose the Ss to more of the stimuli present in the apparatus.

Moltz (1954) compared counterconditioning and extinction groups in such a way as to eliminate the confounding effects of differential movement. All Ss were trained to choose one of two arms of a T-maze and were then shocked at the choice point. The Ss were then divided into a counterconditioning group (fed at the choice point) and an extinction group (merely confined at the choice point). The measure of effectiveness was the persistence of the choice behavior after the switching of the food reward. The results indicated no difference in efficacy of the two procedures.

The most unequivocal study covered by Lomont (1965) was that of Sollod and Sturmfels (1965) in which defecation in rats was used as

the measure of conditioned fear. The CS was a tone and no avoidance training was used. Another element of this study was that it more accurately represented Wolpe's reciprocal inhibition technique in that the presentation of the fear stimulus progressed from presumably weak to strong through change in frequency. While both treatment groups showed reduction of fear, the counterconditioning group underwent a significantly faster reduction.

Rachman (1965) investigated the separate effects of desensitization with relaxation (the hypothesized counterconditioning agent) and desensitization without relaxation (extinction) in human Ss demonstrating fear of spiders. Marked reduction in fear was reported in the counterconditioning group only. The feared stimulus was approached gradually in both groups.

Gale, Sturmfels and Gale (1966) compared counterconditioning and extinction of a conditioned emotional response (defecation). Again, both groups received the CS by progressive approach. The results indicated that the counterconditioning procedure was more effective than extinction in terms of time required to eliminate the fear response.

Progressive approach vs. full strength presentation of the feared stimulus

Studies using rats as Ss by Moltz (1954), Elder, Noblin and Maher (1961) and Berkum (1957) are all similar in that Ss were subjected to fear conditioning in one alley and then counterconditioned (taught to approach for food) in alleys differing from the original alley either in color or in distance. The Ss were then retested for avoidance in the original alleyway. The results across studies are consistent in that no differences were shown where color was the dimension of progressive approach and a difference in favor of progressive approach

was demonstrated where distance was the manipulated variable.

In another study using rats, Kimble and Kendall (1953) trained the Ss to avoid shock by turning a wheel. One group was subjected to extinction by progressive approach (change in cycles per second of tone CS) while another group received ordinary extinction. Non-escape responding occurred significantly quicker in the former group.

It should be noted at this point that the studies supporting the hypothesis that counterconditioning is more effective than extinction all include a progressive approach procedure as well. They are designed so that the separate effects of these two factors cannot be appraised. Likewise in the studies dealing primarily with progressive approach vs. full presentation of the CS, all include feeding (counterconditioning) in both groups. The exception is the study by Kimble and Kendall (1953) discussed above. An hypothesis consistent with the above body of literature is that a counterconditioning agent adds effectiveness only when progressive approach is also employed, but progressive approach facilitates both counterconditioning and extinction of conditioned fear.

Spontaneous recovery and reacquisition of fear as a function of different methods of fear removal

The only study available which approaches this problem is the study by Gale, Strumbels and Gale (1966) which is discussed above. The Ss were subjected to relearning trials following testing for fear removal. The Ss receiving counterconditioning of fear responses showed slower relearning of fear than did the extinction Ss. This result is equivocal, however, because of a difference between groups in continued treatment past the point of minimum fear.

The literature bearing on the questions being asked herein is in many cases only indirectly applicable and none of the studies separates

the effects of extinction, counterconditioning and progressive approach so that these factors can be evaluated separately and in all possible combinations. Such a study would require four treatment groups:

(1) extinction, (2) counterconditioning, (3) extinction plus progressive approach and (4) counterconditioning plus progressive approach.

A weakness inherent in animal studies concerned with overcoming fear is that the fear is almost always conditioned in the same laboratory apparatus that is used in treating the fear. This is unlike clinical situations wherein patients present themselves for treatment with the fears already operating and the formative conditions usually can only be speculated. In order to better approximate clinical conditions, Ss (Cebus monkeys) exhibiting a non-adaptive (in the experimental situation) fear were chosen. The fear stimulus was a stuffed "teddy bear".

Avoidance behavior has been shown to be an adequate measurement of fear (Hall, 1955) and, in fact, the behavioral act of avoidance is often the cause of the difficulties bringing phobic patients to treatment. Avoidance is, therefore, the favored criterion for measurement of change. Studies in the literature using avoidance behavior as the measurement criterion have run into difficulty keeping the conditions of treatment constant across groups when comparing extinction and counterconditioning in that the counterconditioning treatment usually introduces the probability of more movement in the apparatus than does extinction. In addition these studies do not control for the amount of food intake (the usual counterconditioning element) across groups. This study is designed to hold constant all known conditions across treatment groups except the one directly under study, while using the

avored criterion of change in avoidance behavior as the measurement of effectiveness of treatment.

Following the above guidelines, the present study will attempt to shed some light on the following questions:

1. What is the effect upon reduction in fear (decreased avoidance) of counterconditioning vs. extinction?
2. What is the effect upon reduction in fear of progressive approach vs. full strength presentation of the feared stimulus?
3. What is the differential effect of the possible combinations of these variables in treatment of fear?
4. In terms of spontaneous recovery and/or reacquisition of fear, is there any difference due to different treatments in overcoming the fear?

METHOD

Subjects

Ten young adult male Cebus monkeys (Cebus Albifrons) with no previous experimental experience were used as Ss. These animals are trapped in their native habitat and previous life experience is not known. Without any training, all animals demonstrated a fear and avoidance of strange furry objects.

Apparatus

1. A straight runway 345 in. long, 24 in. high and 24 in. wide with guillotine doors at both ends was constructed as shown in Figure 1a. The runway was constructed of 1/4 in. wire mesh folded lengthwise and secured to 2 in. by 2 in. wooden beams which served as anchors. Both ends of the runway were left open so that housing cages could be placed at each end.

2. A separate enclosure, designated "treatment surround," was constructed with hardboard sides and a wire mesh top as shown in Figure 1b. The overall length was 8 ft. and a guillotine door separated the enclosure into two compartments, one being 2 ft. and the other 6 ft. long.

A toy stuffed "teddy bear" which has been determined to be a feared object by Cebus monkeys (Plotnik, 1966) was used as a fear stimulus.

Procedure

All Ss were placed on 23 hr. food deprivation two days before the

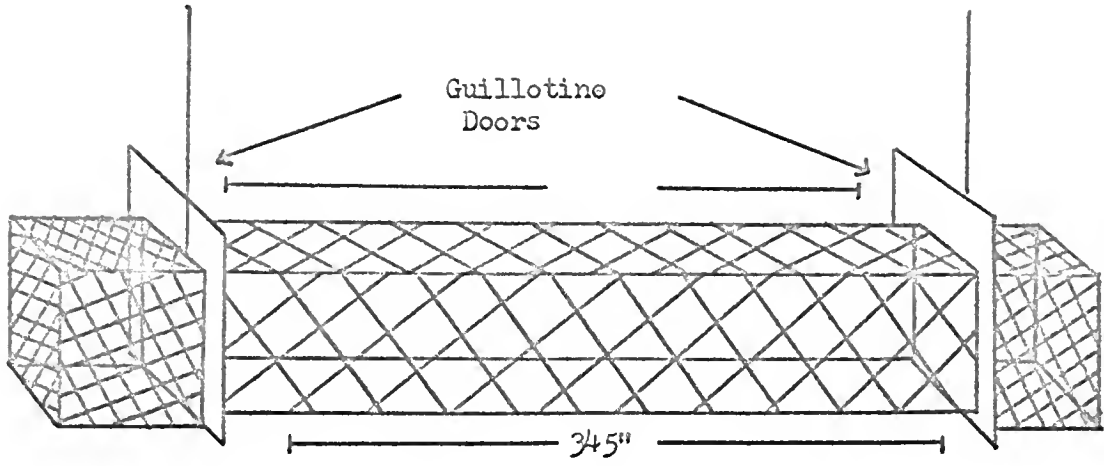


Figure 1a. Runway

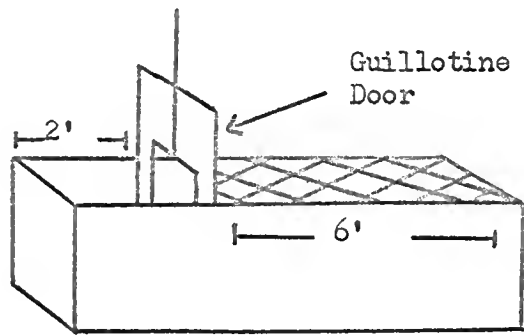


Figure 1b. Treatment Surround

beginning of the experiment and this schedule was maintained throughout the experiment.

Approach training

The first procedure was that of training an approach response in the runway. An S and his housing cage were placed at one end of the runway while an empty housing cage was placed at the other. The S was then allowed six trials per day in which he was allowed to move from one end to the other of the runway to obtain one-fourth of a cube of sugar. Before each trial the sugar was placed in the cage opposite the one holding the S. Each trial was begun by raising the guillotine doors at both ends, which allowed the S access to the runway and both housing cages. Each trial was terminated by lowering the doors when the S entered the cage to obtain the sugar. Training was stopped when the S transversed the runway in 15 secs. or less on the first three consecutive trials of that day.

Pre-treatment avoidance test

Following approach training, a pre-treatment avoidance measure was obtained for each S by placing the stuffed bear, along with the sugar, at the far end of the runway and releasing the S as usual at feeding time.

The minimum distance that separated the S from the sugar and bear within 90 secs. after being released was defined as the pre-treatment avoidance measure.

Each S was then assigned to one of five groups, yielding an N of two per group. The groups were matched on the avoidance-test measure criterion.

Treatment: Phase I

Phase I was designed to determine the effects of different treatments in reducing fear.

Extinction (Ext) Group.--The Ss in this group were treated as follows: Each was placed in the treatment surround separately, so that the S was immediately in front of the movable door to the compartment containing the stuffed bear. The S was given one-half a cube of sugar. (The sugar is presented before the fear stimulus and therefore does not act as a counterconditioning element, but does control for sugar intake and stimulus properties of the treatment surround across groups.) After an interval of about 3 min. the stimulus presentation occurred. A stimulus presentation (trial) consisted of lifting the door, inserting the bear into the cage with the S and closing the door for 2 min. The door was then reopened and the bear removed.

Just prior to each treatment session (except the first) an avoidance measurement as described above was obtained for each S to ascertain the effect of the previous day's treatment.

Trials continued at the rate of one per day until the S entered the cage containing the bear and food during an avoidance measurement session. A maximum of 21 treatments were given to those Ss not reaching this criterion.

Countercondition (CC) Group.--The Ss in this group were treated exactly as those Ss in Ext group except that the sugar was delivered 10 secs. after each trial began rather than before the trial.

Extinction with progressive approach (Ext-PA) Group.--The Ss in this group were treated exactly as Ss in Ext group except (1) the first day's trial consisted of exposing the bear at a distance of 6 ft. from the S and (2) on each subsequent day's trials, the bear was placed

2 ft. closer to the S than on the previous day's trials. On the fourth day's trials the bear was placed in the S's cage as described for all trials in Ext group. Trials were then continued under these conditions to criterion.

Counterconditioning with progressive approach (CC-PA) Group.--The Ss in this group were treated exactly as Ss in Ext-PA group except that the sugar was delivered 10 secs. after each trial began rather than before the trial.

Control Group.--All Ss in this group were subject to the same procedures as described for each of the groups except that during the treatment trials the door was not raised so that the S was never exposed to the bear.

Treatment: Phase II

Phase II was designed to determine the effects of different treatment on spontaneous recovery. This was accomplished by waiting four days after the criterion was met and at this time reintroducing experimental Ss to the runway for an additional test of avoidance.

Treatment: Phase III

Phase III was designed to shed some light on the question of whether or not some treatments more than others leave the S more susceptible to reconditioning.

All experimental Ss were treated as follows: Each S was placed in the treatment apparatus and the bear was exposed to each S for 30 secs. as in the previous Ext group treatment trials. However, during this phase the bear was shaken vigorously. All Ss were given trials on four successive days and then given an avoidance test in the runway 23 hrs. following each session in order to compare groups on reacquisition of fear.

RESULTS

Phase I: Effects of treatments on avoidance behavior

Figure 2 shows the mean avoidance measure for each treatment group and for the control group. The raw measurement scores have been transformed by means of a three-term moving average (Hoel, 1960). As these measurements were made between treatment sessions, they reflect the change in the approach-avoidance balance throughout the treatment course. The exception is the first measurement shown for each group which was the measurement used for matching groups prior to the introduction of treatment.

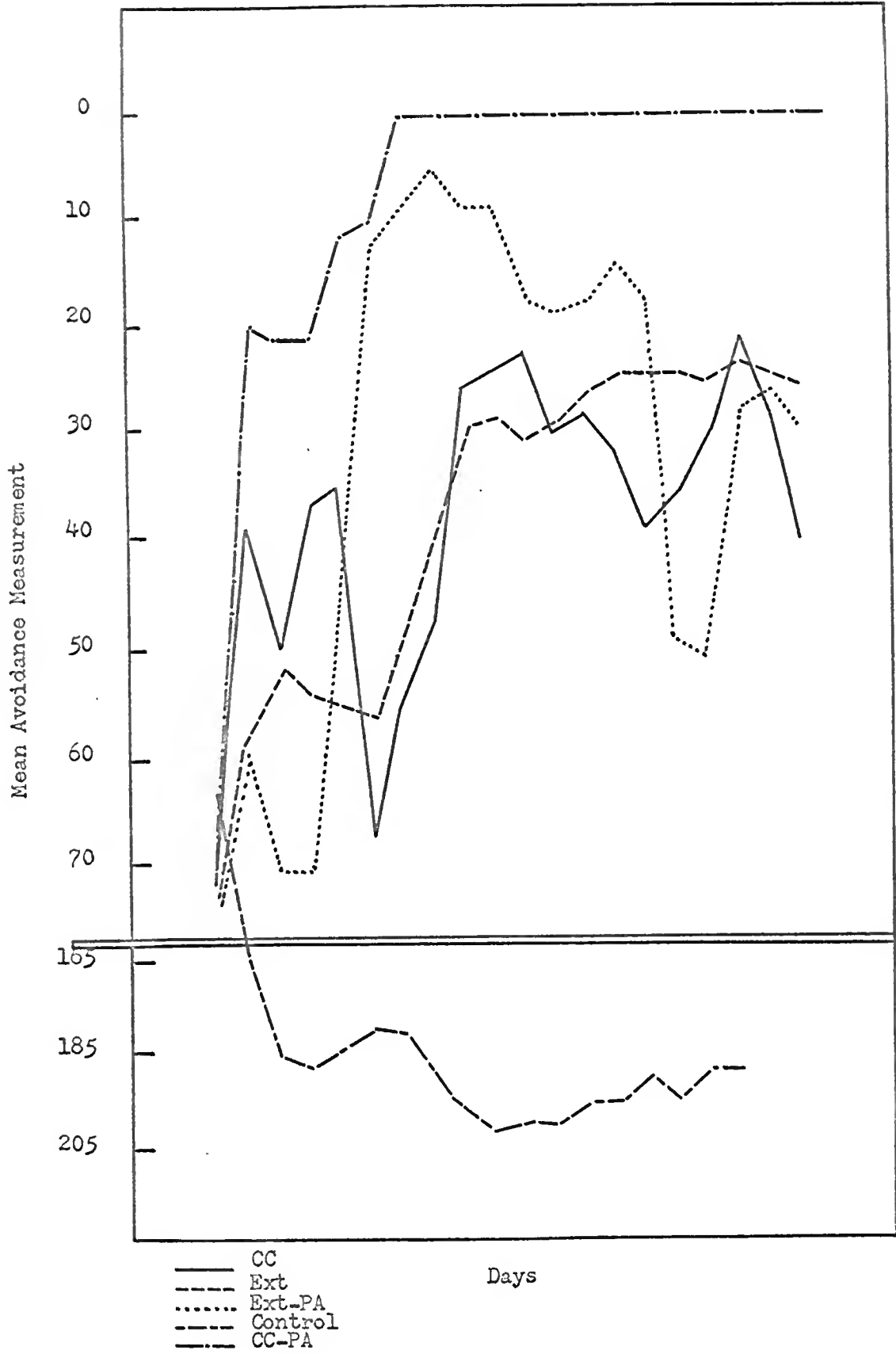
From this figure it may be seen that all groups were essentially the same prior to treatment and that all treatment groups diverged noticeably from the control group across the treatment course. In addition it appears that the CC-PA treatment group showed the most rapid overcoming of avoidance. However an analysis of variance showed a non-significant difference across trials between groups [$F(4,5) = 3.59$; $p < .10$].

A t test comparing the control group to all treatment groups was highly significant ($t = 3.73$, $p < .01$). Indications are, therefore, that all methods of treatment were more effective than no treatment but that there was little difference in effectiveness of any one treatment over the others when considering all group performances across all treatment trials.

In terms of efficiency in time required to overcome avoidance,

FIGURE 2

Mean Avoidance Measurement (Inches) for Each Group
Throughout Phase I. Raw Scores Transformed by Means of
Three-Term Moving Average



the results appear somewhat different. Table 1 shows the number of days of treatment required to allow for complete overcoming of avoidance for each S and the group means.

From Table 1 it may be seen that all treatments were more efficient than non-treatment, that the counterconditioning component alone added somewhat to efficiency only when progressive approach was present, that the progressive approach component alone added somewhat to efficiency only when counterconditioning was present, and that counterconditioning plus gradual approach (as represented by CC-PA group) was the most efficient treatment of all in terms of number of occurrences necessary to reach a non-avoidance criterion. A one-tail Mann-Whitney test comparing the CC-PA group to all other groups was significant ($P < .044$).

Figure 3 shows the avoidance measurements (raw data) for each S across the entire treatment program (Phase I). It may be seen that in no case did a S reach the non-avoidance criterion after the eighth treatment. It seems that either avoidance was completely overcome by this time or that the tendency was to show more avoidance as treatment continued. The S showing the least avoidance consistently after treatment eight seems to have performed asymptotically (Subject 25).

In order to relate each S's best single performance (least avoidance) to the type of treatment regime, a quantitative comparison was attempted. The avoidance measurement for each S that reflected the least amount of avoidance for that S of any of his avoidance measurement trials was used along with the pre-treatment measurement for each S to generate a change score. The method of transformation followed that of Lang and Lazovik (1963) and obeyed the following formula:

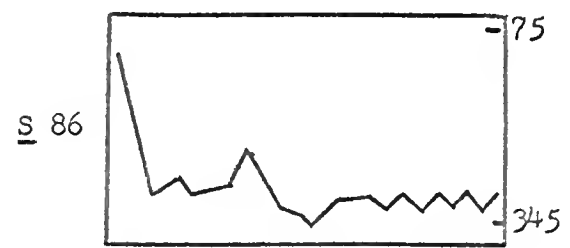
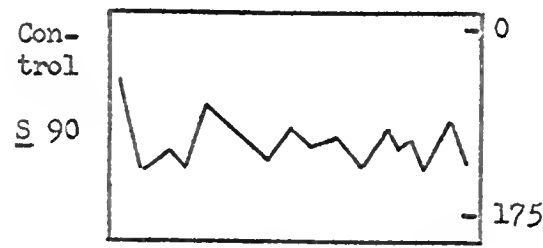
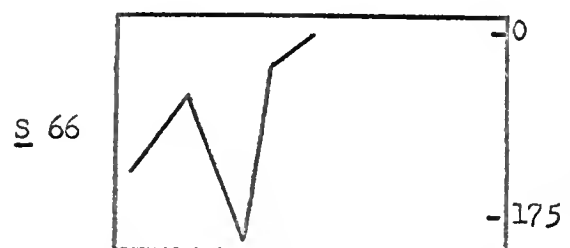
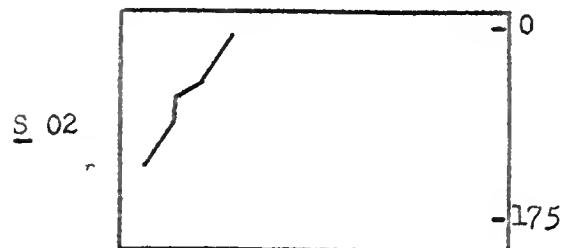
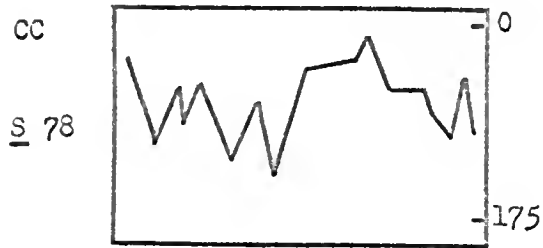
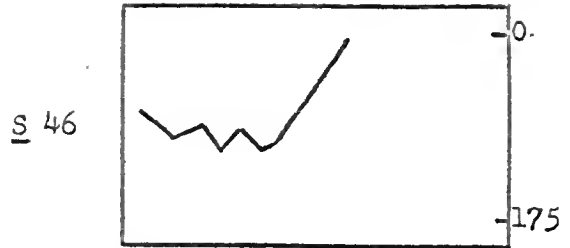
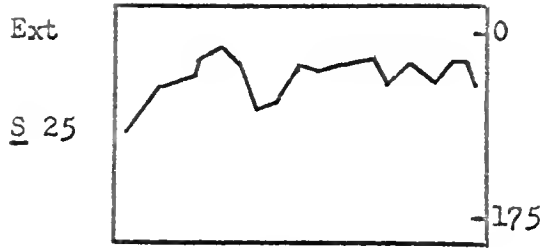
TABLE 1
 Number of Days of Treatment Required
 to Completely Overcome Avoidance

	Groups				
	Control	Ext	Ext-PA	CC	CC-PA
	20*	22	22	22	6
	22	7	7	2	1
Mean	21	14.5	14.5	12	3.5

* This S did not overcome avoidance but became ill after 20 treatments and could not be treated any further.

FIGURE 3

Avoidance Measurements (Raw Data) for Each S
Across Phase I Treatment Program



Avoidance Measurement (Inches)

Days

Days

$$\text{percent change score} = \frac{\text{pre-treatment score} - \text{best performance score}}{\text{pre-treatment score}}$$

Change scores for each S are presented in Table 2.

The data in Table 2 indicate some added effectiveness was gained by the use of progressive approach whether counterconditioning was present or not (Ext vs. Ext-PA, CC vs. CC-PA, and CC + Ext vs. Ext-PA + CC-PA). The added variable of counterconditioning appears to contribute to effectiveness only when progressive approach was also used (Ext-PA vs. CC-PA). A comparison of the CC group with the Ext group indicates that extinction was slightly more effective than counterconditioning when progressive approach was not included.

It may be seen in Table 2 that both Ss in the CC-PA group meet the non-avoidance criterion while only one S did so in each of the other treatment groups. In the control group both Ss showed more avoidance.

All treatments taken together and compared to the control group showed a significant difference ($P < .022$) by use of a one-tail Mann-Whitney test.

Phase II: Spontaneous recovery

Figure 4 shows the last three treatment trials for each treatment S, the spontaneous recovery measurement taken four days after the last measurement of treatment effect, and the avoidance measurements following each reconditioning trial.

For those Ss that completely overcame avoidance during treatment, there was no spontaneous recovery of fear to a degree sufficient to prevent complete approach on the spontaneous recovery measurements. For those three Ss that did not completely overcome avoidance during the treatment phase, two showed less avoidance on the spontaneous recovery

TABLE 2
 Percentage Change Scores (Inches)
 for Each S and Group Means

Groups	Control	Ext	Ext-PA	CC	CC-PA
<u>Ss</u>	-16.67	30.77	66.67	22.22	100.00
	-15.46	100.00	100.00	100.00	100.00
Mean	-16.56	65.39	83.34	61.11	100.00

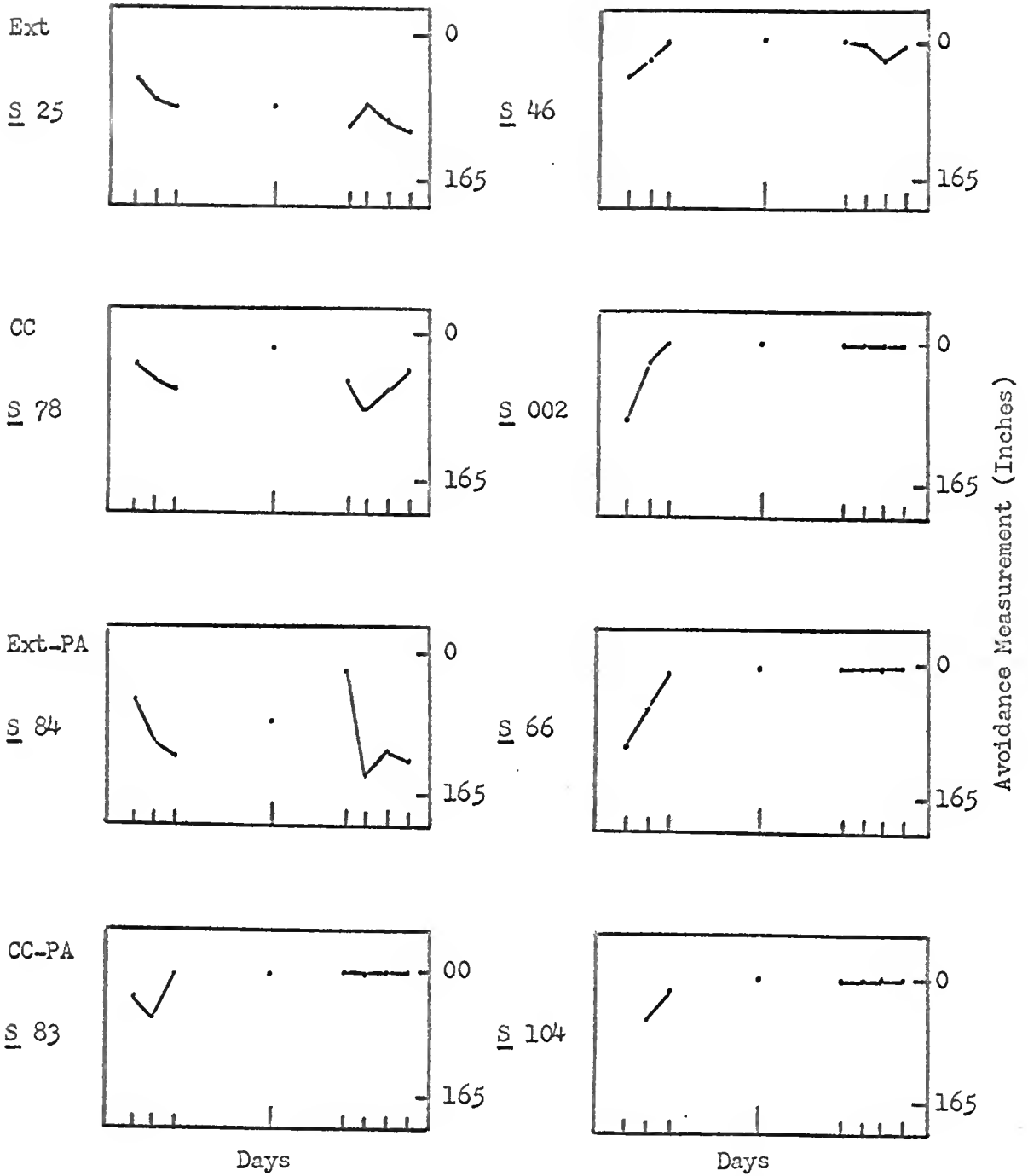


Figure 4. Last Three Treatment Measurements, Spontaneous Recovery Measurement and Four Reconditioning Measurements for Each Treatment S

measurement and one showed a small increase.

Because of the variability of intrasubject measurement during Phase I, the spontaneous recovery measurements were not subject to evaluation for significance between groups. Indeed, it seems that the treatment differences are of little importance, while success or failure during treatment is a more crucial difference in appearance of spontaneous recovery.

Phase III: Reconditioning of fear

From Figure 4 it may seem that those five Ss that completely overcame avoidance during treatment showed no avoidance across reconditioning trials, just as they showed no spontaneous recovery. Also, as in the spontaneous recovery data, the three Ss that did not completely overcome avoidance in the treatment phase showed an apparent reconditioning effect, but again, this could not be said to be outside chance expectations when considering intrasubject variability.

DISCUSSION

It is apparent that the statistical computations and trends noted in the data must be regarded with reserve because of the small size of the groups. Some hypotheses are suggested, however, concerning some of the questions raised in the introduction of this paper.

1. What is the effect upon reduction in fear of counterconditioning vs. extinction?

The data suggest that counterconditioning was more effective than extinction only when progressive approach was also used. This was the case in terms of efficiency in time and also in terms of the percentage of change effected. When the element of gradual approach was removed (as in comparing the Ext group and CC group) then there was no apparent difference between groups on any of the dimensions analyzed herein.

2. What is the difference in effect upon reduction of fear between progressive approach and full strength presentation of the feared stimulus?

In terms of time efficiency, progressive approach added effectiveness when compared with immediate full presentation only when counterconditioning was also present. In terms of maximum percentage of change effected, progressive approach was more effective both when counterconditioning was present and when it was not.

3. What is the differential effect of the possible combinations of these variables in treatment of fear?

It is clear that in all comparisons made, the combination of counterconditioning and gradual approach added to effectiveness of treatment over any other treatment alone or any other combination of treatment procedures.

All of the above hypotheses are consistent with the literature covered in the introduction of this paper except our finding that suggests that progressive approach is superior to immediate, full presentation in terms of time efficiency only when counterconditioning is present. This finding is contradictory to the result of the study by Kimble and Kendall (1953).

The trends in the data support Wolpe's (1958) theoretical assumptions that counterconditioning is an effective therapeutic element when the anxiety provoking stimuli are presented by progressive approach so as to allow the reciprocally inhibitory response to occur.

No light was shed on the last question raised concerning spontaneous recovery and reconditioning of fear as a function of treatment differences.

As reported earlier, no S reached non-avoidance criterion between the ninth and twenty-second treatment and there was an apparent trend toward more avoidance after treatment nine. This finding is unexpected in that the literature suggests gradual reduction of avoidance behavior with continued exposure to feared stimuli when no escape is possible (Kimble, 1961). A possible explanation is that the treatment trials were so short and so spaced that there was insufficient exposure for some Ss to benefit from them. Put another way, it is possible that longer or more frequent treatment trials would have prevented the occurrence of the observed increased avoidance. However, the fact that

control Ss showed an immediate increase in avoidance across trials while all treatment Ss showed some decrease indicated that the treatments were effective for a while at least. In fact, the increasing avoidance by the control Ss indicates another factor is active.

While no escape was possible during treatments in the treatment surround, it is possible that all Ss were furnished opportunity to escape in the avoidance measurement runway. These measurement trials often ended after the S made an approach toward the bear and sugar but then scurried back to the start cage. Trial termination was effected by closing the guillotine door exposing the bear, then the guillotine door between the S and the runway. If removing visual exposure of the bear was reinforcing as it probably was, then these were escape trials.

If this is the explanation for the observed phenomenon in the control Ss, it still leaves something to be desired in explaining the differences among treatment Ss. The above conditions of treatment and avoidance measurement set up conflicting drive states with the balance seemingly being tipped in favor of non-avoidance in the short run and avoidance in the long run. These conditions are, however, very like those existing in the clinical situation in that the patient is treated in the office while "measurements" of treatment effectiveness are made in other situations where avoidance and escape are possible alternatives to non-avoidance on the patient's part. Because of the similarity of this design to the clinical situation, means of overcoming the tendency toward increased avoidance ought to be investigated rather than attempting to design out this factor in future research.

Several approaches to overcoming this unexpected tendency toward

increased avoidance in later trials may be experimentally tested. Experiments designed to investigate the effect of: (1) varying lengths of exposure of the fear stimulus during treatment and (2) increasing lengths of exposure across treatments seem to be promising possibilities.

Procedurally, there were several problems encountered during the present experiment.

Many potential Ss were eliminated because of the wide divergence in performance at the point of taking a pre-treatment avoidance measurement. While some Ss showed no avoidance, many were eliminated because they showed too much. A more economical method of matching groups would have included the possibility of reinstating approach training until an acceptable avoidance measure was obtained.

Attempts to measure spontaneous recovery in the present design may have been frustrated by an unforeseen problem. There was a qualitative difference introduced between Ss that completely overcame avoidance and those that did not. Those Ss doing so received additional reinforcement (sugar) for the approach gradient when reaching the no-avoidance criterion. This additional strengthening of the approach response was not experienced by those Ss not reaching criterion.

The same problem presented itself in the reconditioning phase in that those Ss reaching the no-avoidance criterion had additional reinforcement of approach responses that the remaining Ss did not have. In addition, opportunity for reinforcement occurred on each measurement trial between reconditioning trials. It is probable that this accounts for the lack of effectiveness of the reconditioning stimulus with those Ss having previously reached no-avoidance criterion. Both spontaneous

recovery and reconditioning would best be evaluated in independent experiments in which all Ss could be treated to a specific non-avoidance criterion that would be equal across groups.

SUMMARY

The concept of "reciprocal inhibition" (Wolpe, 1958) has been found to be an effective clinical technique, particularly in the treatment of phobias. The hypothesized therapeutic principles are: (1) "If a response antagonistic to anxiety can be made to occur in the presence of anxiety-evoking stimuli so that it is accompanied by a complete or partial suppression of the anxiety response, the bond between these stimuli and the anxiety responses will be weakened" (Wolpe, 1958), and (2) it is necessary to approach the anxiety provoking stimulus gradually so as to allow the reciprocally inhibitory response to occur (Wolpe, 1958).

These assumptions, that counterconditioning rather than extinction is taking place and that presentation of the feared stimulus by progressive approach is necessary, are now being questioned. Lomont (1965) pointed out that in the application of this technique all conditions for pure extinction are present and that it may be that the counterconditioning agent is not in fact responsible for the effect. He also noted that there is little experimental evidence supporting the assumption that presentation of a feared stimulus by a progressive approach leads to quicker removal of fear than does repeated full presentations.

A review of the literature revealed that there were no published studies which separated the effects of extinction, counterconditioning and progressive approach so that these factors could be evaluated

separately and in all possible combinations. In order to make such an evaluation possible, the present study employed four treatment groups and a control group. The treatment groups were extinction, counterconditioning, extinction plus progressive approach and counterconditioning plus progressive approach.

Ten Cebus monkeys were used as Ss. Without any training, all Ss demonstrated a fear of a toy "teddy bear" which was used as the fear stimulus. The Ss were trained to transverse a runway to obtain sugar, after which each S was allowed to approach the sugar while the bear was also present at the end of the runway. The minimum distance that separated the S from the sugar and bear was defined as the pre-treatment avoidance measure which constituted the criterion for matching groups. The same runway was used to determine change in avoidance behavior throughout the course of treatment. The treatments (presentation of the feared stimulus under the conditions appropriate to each of the treatment groups) were conducted in a separate apparatus.

Although trends noted in the data must be regarded with reserve because of the small size of the groups, some hypotheses were suggested. In terms of both percentage of change effected and efficiency in time, the data suggested that counterconditioning was more effective than extinction when progressive approach was also used. When progressive approach was not used, there was little difference between extinction and counterconditioning. In terms of time efficiency, progressive approach added effectiveness when compared with immediate full presentation only when counterconditioning was also present. In terms of maximum percentage of change effected, progressive approach was more effective both when counterconditioning was present and when it was not.

It was noted that no S reached non-avoidance criterion between the ninth and twenty-second treatment and that there was an apparent trend toward more avoidance after treatment nine. Possible explanations for this unexpected trend were discussed.

There was an attempt to shed light on the possible differences, due to different treatments, in spontaneous recovery and reacquisition of fear; however, the design proved inadequate to allow for such evaluations. The design problems were also discussed.

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BIOGRAPHICAL SKETCH

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This dissertation was prepared under the direction of the chairmen of the candidate's supervisory committee and has been approved by all members of that committee. It was submitted to the Dean of the College of Arts and Sciences and to the Graduate Council, and was approved as partial fulfillment of the requirements for the degree of Doctor of Philosophy.

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